

What is claimed is:

Sub  
A9

1. A pipelined multistreaming processor, comprising:

an instruction source

5 a plurality of streams fetching instructions from the instruction source;

a dispatch stage for selecting and dispatching instructions to a set of execution units;

10 a set of instruction queues having one queue associated with each stream in the plurality of streams, and located in the pipeline between the instruction source and the dispatch stage; and

a select system for selecting streams in each cycle to fetch instructions from the instruction source;

15 characterized in that the number of streams selected for which to fetch instructions in each cycle is fewer than the number of streams in the plurality of streams.

20 2. The processor of claim 1 wherein the number of streams in the plurality of streams is eight, and the number of streams selected for which to fetch instructions in each cycle is two.

25 3. The processor of claim 2 wherein the select system monitors a set of fetch program counters (FPC) having one FPC associated with each stream, and directs fetching of instructions beginning at addresses according to the to the program counters.

4. The processor of claim 2 wherein each stream selected to fetch is directed to fetch eight instructions from the instruction cache.

5. The processor of claim 1 further comprising a set of execution units to which the dispatch stage dispatches instructions.

5 Sub A9 6. The processor of claim 5 wherein the set of execution units comprises eight Arithmetic-Logic Units (ALUs), and two memory units.

10 7. In a pipelined multistreaming processor having an instruction queue, a method for decoupling fetching from a dispatch stage, comprising the steps of:

(a) placing a set of instruction queues, one for each stream, in the pipeline between the instruction queue and the dispatch stage; and

15 (b) selecting one or more streams, fewer than the number of streams in the multistreaming processor, for which to fetch instructions in each cycle from an instruction source.

20 8. The method of claim 7 wherein the number of streams in the plurality of streams is eight, and the number of streams selected for which to fetch instructions in each cycle is two.

9. The method of claim 8 wherein the select system monitors a set of fetch program counters (FPC) having one FPC associated with each stream, and directs fetching if instructions beginning at addresses according to the to the program counters.

25 10. The method of claim 7 wherein each stream selected to fetch is directed to fetch eight instructions from the instruction source.

11. The method of claim 6 wherein the dispatch stage dispatches instructions to a set of execution units.

12. The method of claim 11 wherein the set of execution units comprises eight Arithmetic-Logic Units (ALS), and two memory ports.

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